REMARKS

Amendments to the Claims

Claim 1 has been amended without prejudice and new claim 16 introduced to more particularly point out and more distinctly claim the subject matter which applicant regards as the invention and to recite preferred embodiments of the invention that are more clearly differentiated from the prior art.

Claim 1 has been amended to specify that it is during under-cooling of the fruit (step ii), that the temperature difference between the core and the surface of the fruit remains less than 1.5 C as stated on page 4, lines 31-33 and discussed in connection with examples 4 to 6 on page 7, line 32 to page 8, line 2.

New claim 16, specifies that the frozen fruits produced by the process have a fracture force of less than 0.01 kN when measured at -18° C as is disclosed on page 8, lines 21 to 24 in connection with examples 4 to 6. The term "fruits" is defined on page 2, lines 24-27 of the specification to mean either the complete fruit or parts of fruit, e.g., cubes. Applicants further disclose on page 3, lines 22-26 that the fracture force of the frozen fruits is measured at a temperature of -18° C in their mechanical testing method, i.e., in the frozen state.

Claims Rejection under 35 USC §112

Claims 1, 3-5 and 13-14 were rejected under 35 U.S. C. §112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 has been amended to make clearer that the temperature difference between the surface and core of the fruit is maintained at less than 1.5° C during the under-cooling step. Put another way, under-cooling takes place at a rate such that the temperature difference between the surface and core of the fruit remains at less than 1.5° C.

Limitations concerning fracture force have been removed from claim 1 and incorporated into a new dependant claim 16. The verbiage has been simplified to make clearer that the frozen fruits cooled by applicants' process have a fracture force less than 0.01 kN when measured at a temperature of -18° C.

Applicants' believe that the metes and bounds of the amended claims are definite and respectfully request that the §112, second paragraph rejection of claims 1, 3-5 and 13-14 be reconsidered and withdrawn.

Double Patenting

Claims 1, 3-5 and 13-14 were rejected for obviousness-type double patenting over claims 1-5 of U.S. Patent No. 7,169,426.

Applicants herewith provide a Terminal Disclaimer over the aforementioned U.S. Patent. The Terminal Disclaimer is believed to obviate this rejection.

Claims Rejection under 35 USC §103

Claims 1, 3-5 and 13-14 were rejected under 35 U.S.C. 103(a) as being unpatentable over Yamane et al (EP0,815,746) in view of Desrosier et al (Fundamentals of Food Freezing) and Jay (Modern Food Microbiology).

Yamane et al discloses a process for the production of frozen fruit comprising the steps of cooling fruits to 0° C, under cooling fruits from 0° C to a temperature up to -18° C at an ultra-slow cooling rate in the range of -0.01° C/hr to 0.5° C/hr and then reducing the temperature further to produce fruits in the frozen state.

Yamane et al further teaches on page 5, lines 6-10 that

"Furthermore, investigation on the part of the inventors has revealed that when the above-mentioned slow cooling treatment conditions and process are not employed, that is, when a slow cooling treatment involving cooling at a gradual rate of 0.01° to 0.5° C/hour to below the freezing point is not performed, it is difficult to maintain a food or the like in a non-

frozen state in the temperature zone below the freezing point, and the stated objects cannot be achieved. "

Thus, Yamane et al teaches that the process becomes inoperable for its intended purpose when the rate of under-cooling is greater than 0.5° C/hr.

Finally, Yamane et al are silent about the flavor and texture of frozen fruits eaten in the frozen state.

Desrosier et al discloses in Fundamentals of Food Freezing that "great advances have been made in the techniques of freezing fruit rapidly. The present individually quick-frozen (IQF) and cryogenic frozen fruits are superior in quality and stand up better to thawing than the fruits frozen slowly in packages cartons or bulk containers" (p48).

In Modern Food Microbiology on page 325, Jay defines quick or fast cooling as "a process by which the temperature of foods is lowered to about -20° C within 30 minutes." According to Jay this treatment may be achieved through the use of air blasts of frigid air blown across the food being frozen", e.g., through the use of a blast freezer.

Jay further defines slow cooling as a process "whereby the desired temperature is achieved within 3-72 hours" as in a home freezer.

Both Desrosier et al and Jay are silent about a rate of under-cooling chosen to produce a temperature difference between the surface and core of the fruit during the under-cooling step that is less than 1.5° C.

Both Desrosier et al and Jay are silent about the effects of cooling process on the flavor and texture of frozen fruits that are designed to be eaten in the frozen state.

In contrast, applicants' invention is directed to the problem of the production of frozen fruits which when eaten frozen, retain the strong and characteristic flavor of unfrozen fruits (page 1, lines 20-23).

Applicants have pointed out in the background to the invention (see page 1, line 25 to page 2, line 6) that not only is the use of "super-slow" cooling rates of 0.01° to 0.5° C/hr impractical on an industrial scale, but such rates actually produce fruits having a mild taste.

In contrast to the teaching of Yamane et al, Desrosier et al and Jay, applicants' have discovered that an under-cooling rate between 2° C/hr and 320° C/hr can be employed (4 to 600 time higher than the maximum rate according to Yamane et al) provided that the cooling rate is chosen such that the temperature difference between the surface and the core of fruit during the under-cooling step remains less than 1.5° C. As will be discussed below comparative experiments carried out by the inventors and summarized in the examples and elsewhere demonstrate that applicants' process produces frozen fruits that are more flavorful and softer (have a lower fracture force) when eaten in the frozen state than prior art freezing processes.

Throughout the prosecution of this application, the Examiner has cited Yamane et al as the primary references which the Examiner has combined with one or more secondary references that teach a faster cooling rate than disclosed by Yamane et al. In the July 10, 2007 Office Action, the Examiner asserted that since Yamane et al discloses cooling and freezing fruits at a slow freezing/cooling rate, and Desrosier et al discloses advantages of

quick cooling/freezing techniques, it would have been obvious to modify the disclosure of Yamane et al and to increase the cooling rate. Applicants respectfully disagree.

The Examiner has proposed as obvious the modification of Yamane et al in light of the teachings of Desrosier and Jay so as to increase the rate of under-cooling disclosed by Yamane et al of from 0.01 to 0.5° C/hour to applicants' under-cooling rate of between 2 and 320 C/hr (a factor of 4 to 600 time higher than the maximum rate according to Yamane et al). However, as discussed above Yamane et al discloses that when a slow cooling treatment involving cooling at a gradual rate of 0.01 to 0.5° C/hour to below the freezing point is not performed, the stated objects of the invention can not be achieved.

In *in re Fritch*, 972 F.2d at 1265 n.12, 23 U.S.P.Q. 2d at 1783 n.12, the court ruled that "A proposed modification [is] inappropriate for an obviousness inquiry when the modification render[s] the prior art reference inoperable for its intended purposes".

In *in re Ratti*, 270 F. 2d 810, 813, 123 U.S.P.Q. 349, 352 (C.C.P.A. 1959) the court held the suggested combination of references improper under §103(a) because it "would require a substantial reconstruction and redesign of the elements shown in [a prior art reference] as well as a change in the basic principles under which [that reference's] construction was designed to operate".

In view of the above well established case law, applicants respectfully submit that the combination of the Yamane et al invention which explicitly requires an ultra-low cooling rate to achieve its intended purpose with Desrosier/Jay which explicitly requires a much more rapid cooling rate than the maximum expressly permitted by Yamane et al is both inappropriate and improper as 103(a) prior art.

The non-obviousness of applicants' invention is further supported by the surprising and unexpected properties of fruits frozen according to applicants' process which applicants' respectfully submit have not been appreciated by the Examiner. Specifically applicants' respectfully draw the Examiners attention to Comparative Examples 1 to 3 and Examples 4-6 described on pages 7-8.

Regarding Comparative Examples 1-3, applicants state that these fruits (mango, kiwi and strawberries) "were frozen in a blast freezer from ambient temperature to -30° C within one hour". Assuming ambient temperature is about 20° C, the cooling rate employed in these comparative examples is about 50° C/hr. Thus, the cooling rate of the Comparative Examples is clearly within the "fast cooling rate regime" suggested by the Examiner according to the teachings of Jay (from 0° C to -20° C in 30 minutes or a rate of 40° C/hour).

As applicants note on page 7, lines 8-10 the fruits frozen according to the method described in the Comparative Examples exhibited little under-cooling (less than 1° C) and the temperature difference between the surface and core of the fruits during the under-cooling step (which utilize the optimum cooling rate according to Jay) was between 1.5° and 4° C, i.e., the temperature differential during under-cooling did not meet applicants' criteria of less than 1.5° C.

In contrast, in Examples 4 to 6 the same fruits were frozen from +10° C to -30° C in a Montford freezer at a rate of 2.5°C/hour (lines 22-24). This cooling rate is only 6% of the optimal cooling rate according to Jay (yet 5 times higher than the maximum permissible under-cooling rate according to Yamane et al) and in fact, falls within the "slow freezing" regime, which according to Jay would be expected to yield frozen fruit having inferior quality. Applicants found that these latter conditions actually provided substantial under-

cooling (7.4° to 9.3°C) and provided a temperature differential between the surface and core of the fruits during under-cooling of less than 1° C and typically around 0.5° C (see page 7, line 24 to page 8 line 2) thus meeting the requirements of applicants' process as recited in claim 1.

Very surprisingly, the fruits frozen according to applicants' process (Examples 3-6) had a much stronger flavor when eaten frozen and exhibited a much lower fracture force in the frozen state (i.e., they would be expected to be easier to chew in the frozen state) compared with fruits frozen according to a process (Comparatives 1-3) that is disclosed in the prior art to "have more advantages from the standpoint of overall product quality" (Jay - page 326 first paragraph under Table 16-2).

Furthermore, as discussed above applicants have also found that the ultra-slow under-cooling practiced by Yamane et al produces frozen fruits having a bland taste (in the frozen state) compared to the process of the current invention.

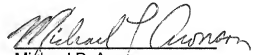
These results are surprising and totally unexpected based on the teachings of the prior art. In particular, Yamane et al and Desrosier/Jay explicitly teach away from the outcome found by employing applicants claimed process.

Finally, applicants' submit that claim 16 which requires that fruits frozen according to applicants' process to have a fracture force of less than 0.01kN when measured at a temperature of -18° C is even more remote from the disclosures in the references cited by the Examiner since these references are completely silent regarding the fracture of fruits in the frozen state.

In view of the forgoing amendment and remarks, applicants respectfully request the 103(a) rejection of claims 1, 3-5 and 13-14 over Yamane et al (EP0,815,746 in view of Desrosier et al (Fundamentals of Food Freezing) and Jay (Modern Food Microbiology) be reconsidered and withdrawn and that the application be allowed to issue.

If a telephone conversation would be of assistance in advancing prosecution of the subject application, applicants' undersigned agent invites the Examiner to telephone him at the number provided.

Respectfully submitted,



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